First Workshop Announcement

Synchrotron Techniques for Environmental Microbiology and Biogeochemistry

Wednesday, October 8, 2003.
Stanford Synchrotron Radiation Laboratory (SSRL).
Co-organized by SSRL, the Advanced Light Source (ALS), and DOE-NABIR.

Environmental microbiology and biogeochemistry have emerged as vibrant scientific fields with cross-cutting research themes emphasizing the interplay and energy flow between microbial communities, inorganic and organic contaminants, (bio)minerals, groundwater, and other solutions. Synchrotron (SR)-based techniques are beginning to play important roles in these research areas because of the utility of SR methods for characterizing metal ion and organic molecule speciation under in-situ conditions in complex environmental materials. The purpose of this meeting is to bring together scientists from the environmental microbiology, biogeochemistry, and synchrotron communities to share ideas. Introductory talks regarding synchrotron techniques will be mixed with scientific talks (not limited to SR-based techniques!) to foster interactions between attendees. Topics to be discussed include mechanisms of metal binding by bacteria, microbially mediated redox cycling of metals in the environment and their application to bioremediation, biomineral structures, compositions, and formation mechanisms, and competitive sequestration of metals by inorganic sinks (oxide, sulfide surfaces, solids) and bacteria.

Morning Program: Introduction to Synchrotron Techniques

Introduction to X-ray Absorption Fine Structure (XAFS) Spectroscopy. J. Bargar (SSRL).
Introduction to μ-SXRF and μ-XAFS Spectroscopy. M.A. Marcus (ALS).
In-situ Characterization of Biogenic Mineral Structures Using SR X-ray scattering Techniques. S.M. Webb (SSRL).
Introduction to SR-based Microdiffraction Techniques. Nobumichi Tamamura (ALS).

Crosscutting Issues in Environmental Microbiology and Biogeochemistry

Ken Nealson (USC), Topic: Microbial Influences on Metals and Minerals.
John Zachara (PNNL), Topic: Biogeochemical Processes in Surface and Subsurface Environments.
Yuri Gorby (PNNL) The Role of Controlled Cultivation in Systems Biology and Biogeochemical Research.
Satish Myneni (Princeton University) Submicron Spectromicroscopy and Chemical Imaging of Functional Groups in Humic and Biological Materials.
Rizlan Bencheikh-Latamani (Scripps Institute of Oceanography) Mechanisms of Uranyl Sorption to Bacterial Surfaces of *Pseudomonas fluorescens*.
Scott Fendorf (Stanford University) Mineral Biotransformations and Their Impacts on Contaminant Attenuation.
Alfred Spormann (Stanford University) Molecular Microbial-Mineral Interactions.

For more information, please visit http://www-ssrl.slac.stanford.edu/ conferences/ssrl30 /workshops.html or contact John Bargar (bargar@ssrl.slac.stanford.edu).